

# University Student's Lifestyle Changes During COVID-19 Lockdown: A Spanish Cross-Sectional Survey.

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## Research Article

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## Abstract

# Background

Coronavirus disease 2019 (COVID-19) pandemic has an impact on the university student's lifestyles. The present study aims to investigate the perceived changes in lifestyles among Spanish university students during the confinement.

## Method:

An observational, descriptive, cross-sectional study with a 2-time cut was conducted during the month of April in 2020. Sociodemographic and anthropometric data was then obtained. The FANTASTIC questionnaire was used to assess lifestyles of the 488 participants who took part in the study. The STROBE cross-sectional reporting guidelines were followed on this study.

## Results

76.3% of the participants were female. Overall, the lifestyles of university students had significantly deteriorated during the period of confinement caused by the COVID-19 pandemic in Spain. University female students have been especially affected compared to their male fellows ( $p = .010$ ). For women, social and family relationships ( $p < .001$ ), personality ( $p < .001$ ), interior ( $p < .001$ ) and career ( $p < .001$ ) were the aspects that worsened during confinement. For men, lack of physical exercise practice ( $p < .001$ ), social and family relationships ( $p < .001$ ) and career ( $p = .002$ ) were affected to a greater extent. In both cases confinement was a protective factor against the consumption of tobacco, toxins ( $p < .001$ ) and alcohol ( $p < .001$ ). Gender ( $p = .008$ ) and obesity ( $p = .044$ ) are the two factors that most affected the change in the score of the FANTASTIC questionnaire.

## Conclusions

The Spanish university students' lifestyles have worsened during the lockdown caused by the COVID-19 pandemic, especially women who were the most affected. Some aspects such as those related to social and emotional behaviors have been deeply affected, while confinement could be a protective factor against previous toxic habits.

## Background

The world is experiencing one of the most important global challenges in infectious disease management in recent times (1). This is the case of the coronavirus pandemic (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) identified in December 2019 in Wuhan (China). Globally, more than 87,000 cases have been confirmed and over 1,899,000 deaths reported (2).

Common symptoms of fever (83–99%), cough (59–82%), fatigue (44–70%), anorexia (40–84%), shortness of breath (31–40%), myalgia (11–35%), and other non-specific symptoms of throat, nasal congestion, headache, diarrhoea, nausea and vomiting are signs of disease. The absence of taste and smell predict the onset of respiratory symptoms (3). There is a high percentage of infected people who have this mild symptomatology or are asymptomatic carriers. However, both the negative evolution towards complex lung diseases, generalized organic inflammation and death, as well as the high capacity for expansion and contagion attributed to this virus, led the World Health Organization to declare in March 2020 the state World Pandemic (4). This caused a wave of confinements around the world as a preventive measure.

Spain decreed the State of Alarm on March 14 with 5,753 cases detected and 136 deaths (5, 6). The Spanish lockdown was one of the most severe restrictions on the mobility of the population in the entire European Union. While in many other countries such as France, the United Kingdom and Germany the population was allowed to go outside for one hour a day, in Spain all exits from home were prohibited except for shopping for basic food and medicine, work in essential areas or transfers to hospital. This meant the temporary closure of schools, universities, companies, shops, bars and restaurants. After 49 days of strict confinement, Spain reached the figure of 25,000 deaths and more than 200,000 infected (7). As of May 2, the population's outings to the streets to play

sports were progressively expanded, as well as the opening of businesses and leisure services. This criteria was not carried out at the same time throughout the country but was applied in a scaled manner in the different regions (8).

During this time, the habits and customs of the population were modified, which could have implications associated with their health and well-being (9). Social distancing and isolation caused by the obligation to stay at home has had an impact on people's lives by modifying their habitual behaviors (10), as well as causing abrupt and radical changes in lifestyles (11). Lifestyles determine health by integrating the set of habits and behaviors that modulate our daily life (12). Aspects such as diet, exercise, the environment, sleep and rest, the consumption of toxic substances or one's personality, among others, play a major role in the development of healthy habits that have an impact on throughout the lives of individuals (13).

University students are a vulnerable population group in terms of mental health (14), as well as in the adoption of risk behaviors for health (15). The university is a context that influences the lifestyles of students (15) and constitutes an active agent in the health promotion (12). However, the closure of the university and the lack of face-to-face classes have lead to a change in the health of the students (14, 16), at an academic level, in life (17, 18) and their future prospects (19).

Spain has an estimated university population of 1,309,781 students distributed in 82 universities (20). During confinement, Spanish universities experienced an unprecedented shift from traditional classroom education to online education. This involved a change in the teaching methodology, adaptation of skills with new communication channels, adaptation of assessment methods, use of information and communications technology, workloads and performance levels (19, 21, 22). Since the declaration of the pandemic, numerous research has been carried out on the effects of the pandemic on the lifestyles of the general population, but scarce in university students. Some studies have investigated the effects on certain aspects of university students' lifestyles specifically in regards to mental health (23, 24), physical exercise (25, 26), diet (27), sleep (28, 29) or the combination of various (30). However, there are few studies that evaluate perceived lifestyles and social and family relationships, drug use, or job satisfaction. Furthermore, we have not found any study evaluating the change in general lifestyles perceived by Spanish university students during the COVID-19 pandemic.

## Material And Methods

### Aim

The main objective of this study was to determine the perceived impact on the lifestyles of Spanish university students during confinement caused by COVID-19. As a secondary objective, it was proposed to analyze those aspects that have been able to most influence the change in the lifestyles of the Spanish university population during quarantine.

### Study design and setting

This is an observational, descriptive and survey study with two temporal cuts (before and during confinement by COVID-19) carried out at the Department of Nursing of the (*blinded for review*) University. To obtain data on the lifestyles of the Spanish university population during the COVID-19 pandemic, a web-survey was used through Microsoft-Forms.

The survey was conducted from the 11th to the 25th April 2020 by using an online platform, accessible with any device with internet connection as smartphones, computers or tablets. The survey was shared through institutional emails, institutional and private social networks (Twitter, Facebook and Instagram) and WhatsApp. Based on other studies (10), this method is effective for the research objectives, since it facilitates the dissemination of the survey questionnaire during a period in which, due to the pandemic, there are many territorial restrictions.

This study complies with the STROBE (Strengthening the Reporting of Observational studies in Epidemiology) cross-sectional reporting guidelines (*Related file 1*).

### Participants

Participants were included in the study based on the following eligibility criteria:

Inclusion criteria:

- Be 18 years of age or older.
- Be enrolled in one of the Spanish universities.
- Online acceptance of informed consent.

Exclusion criteria:

- Having a serious disability or pathology that limited or conditioned the life habits.
- Be a graduate student.

### **Sample size calculation**

The calculation of sample size and power were performed while using Sample Size Calculator Qualtrics (<https://www.qualtrics.com/blog/calculating-sample-size/>), as previously reported in other studies (31, 32).

Considering a 95% confidence interval, a margin of error of 5% and the population size of 1,309,791 registered Spanish university students (20), the minimum number of cases required for a statistical power of 95% was of 385 cases. We adjusted this simple size to accommodate potential losses. Academic literature (33) recommends adding 10% to the initial calculation, so we set the estimated loss ratio to 10%. Based on the data, the sample size adjusted was of 424 participants.

### **Data collection**

According to other studies (34), due to the special circumstances of confinement and the urgency of obtaining the information, the sample carried out was of convenience, being applied to groups of students of which the researchers are professors, as well as students of colleagues from other Spanish universities. The sample was obtained from a group of 40 Spanish universities and a total of 488 students.

The study was carried out during the State of Alarm decreed in Spain due to the COVID-19 pandemic, which made it impossible to carry out the questionnaire in person. The questionnaire was distributed virtually through a platform designed for conducting surveys (Microsoft Forms). This format favored the sincerity of the participants by avoiding the possible bias of feeling judged by the person who administered the questionnaires. With the aim of knowing the change perceived by the participants in their lifestyles, they were asked through the survey platform to answer the questionnaire twice. The first in reference to their lifestyle before COVID-19 pandemic (January 2020) and the second, at the time of confinement (April 2020).

### **Outcome measures**

#### **Sociodemographic and anthropometric data**

An ad-hoc survey obtained sociodemographic information related to age and sex, university studies (university where you are enrolled, university degree, city where you reside), with confinement (city of confinement, people with whom you live before and during confinement, characteristics of the dwelling and number of departures from the home per week during the confinement) and related to COVID-19 (positive infection or suspected infection in the participant or partner/s). Additionally, the self-reported height and body weight were included to calculate the Body Mass Index (BMI) ( $\text{Kg/m}^2$ ) of the participants.

#### **Lifestyles**

The lifestyle variable was measured with the validated FANTASTIC questionnaire (35). This instrument was designed by Wilson and Ciliska (36) to measure the lifestyle of a population and has been validated in different countries such as Mexico, Colombia, Brazil and Spain, with a version available in Spanish and English. The current investigation used the Spanish version. FANTASTIC has been validated in different contexts, such as in the working population, students or general consultation patients (35, 37, 38).

The FANTASTIC questionnaire consists of 25 closed items that explore lifestyles divided into 9 dimensions: family and friends, physical activity, nutrition, tobacco and other toxic consumption, alcohol consumption, hours of sleep, use of seat belts and presence of stress, personality type, positive thoughts, anxiety, depression and satisfaction with the tasks performed. The evaluation of the answers is carried out using a Likert-type scale, which measures the degree of opinion or behavior regarding each

question asked, attributing a score that ranges from 0 to 4, where 0 corresponds to never or almost never and 4 to always or almost always, depending on the nature of the question. The maximum total possible score is 100 points and the interpretation of the data in relation to healthy lifestyles in general is as follows: from 85 to 100 points the lifestyle is considered as fantastic, from 70 to 84 good, from 60 to 69 average, from 40 to 59 low and up to 39 points dangerous. The reliability of the questionnaire in its validated version in Spanish, measured through Spearman's test-retest correlation, gave very good reliability. ( $r = 0.81$ ,  $p = .01$ ) (35).

## Data analysis

The analysis was performed with the IBM SPSS statistics v.21 software.

Statistical analysis of sociodemographic data was done using the mean and standard deviation (SD) or medians and minimum and maximums for the quantitative variables according to their distribution. For qualitative or categorical variables, measures of frequency and percentages were used. The parametric properties of the FANTASTIC questionnaire scores were analyzed to determine the normality of their distributions. The Student's paired  $t$  test was used to analyze the differences between pre and during quarantine. The Student's unpaired  $t$  test analyzed the differences between males and females. The Chi square ( $\chi^2$ ) test was used to determine the significance of differences in frequency distribution of FANTASTIC categories and Fisher's exact was used when any of the expected value was less than 5. To study the association between gender (independent variable) and lifestyles (dependent variable), a logistic regression model with sequential backward adjustment was fitted. The effect size was found based on Cohen's  $d$  (39), considering 0-0.3 low, >0.3-0.8 moderate, >0.8 big effect size.

Those questionnaires that were not complete were excluded from the analysis. The results were considered statistically significant when  $p < .05$ .

## Ethical considerations

The project was approved by the Research Ethics Committee of the Camilo José Cela University (code: 06\_CEI\_2020) (*Related file 2*). The study was conducted in full agreement with the national law (Law 14/2007 on Biomedical Research and Law 15/1999 on Protection of Personal Data) and the Declaration of Helsinki (2000).

All participants were informed about the study and were required to accept the informed consent before participating in the study. Their participation was anonymous and voluntary, and students could withdraw from the study without any consequences at any time. Participants completed the questionnaire directly on the institutional Microsoft Forms platform, where the information was kept in a private storage of the university to which only the researchers had access. Participants' personal information were anonymized to maintain and protect confidentiality. We did not ask for participant 'name or email direction. The anonymous nature of the web-survey does not allow to trace in any way sensitive personal data. Only the researchers had access to the research data.

## Results

A total of 495 questionnaires were received. Of these, 7 questionnaires were discarded because they were incomplete. Consequently, 488 questionnaires were analyzed. The sociodemographic and anthropometric characteristics of 488 participants were summarized in **Table 1**. The vast majority gender was female with 73.6% ( $n = 359$ ) and the total sample have a median age of 21 years. Most men and women had normal weight according to the BMI (73.4%), with significant differences in the proportion of women with low weight ( $\chi^2 = 8.71$ ,  $p = .003$ ). Most of the Spanish regions were represented, Extremadura and the Balearic Islands being the only ones from which no participants were obtained. By areas of study, women studied more health sciences compared to men ( $\chi^2 = 25.85$ ,  $p = .001$ ), while men studied more engineering and architecture careers than women ( $\chi^2 = 39.02$ ,  $p = .001$ ). As for the participants with work activity, there was a higher proportion of men who worked both before ( $\chi^2 = 7.5$ ,  $p = .006$ ) and during ( $\chi^2 = 4.8$ ,  $p = .028$ ) the quarantine, with women who lost the most jobs during the confinement. In general, statistically significant differences were found at work and in their weekly hours since during the quarantine there were fewer people working ( $\chi^2 = 96.3$ ,  $p < .001$ ) and those who worked, did more hours ( $p < .001$ ). Similarly, there were differences regarding the change of address (See Table 2); most of the participants went from living with their roommates (41.6% vs 4.1%,  $\chi^2 = 20.1$ ,  $p < .001$ ) to living with their parents (48.8% vs 86.5%,  $\chi^2 = 0.3$ ,  $p < .001$ ). Regarding the data on COVID-19, 92.4% had no confirmed infection or suspected disease or lived with people with symptoms. 59% affirm not leaving home during mandatory confinement.

**Table 3** shows the differences by gender of global scores of the FANTASTIC questionnaire, its dimensions, items and categories of the studied population pre and during confinement. The Global Score of lifestyles measured with the FANTASTIC questionnaire worsened during confinement in women ( $p < .001$ ) with a moderate effect size ( $d 0.32$ ). By categories (fantastic, good, moderate, low and worrying) significant differences were found in the increase of participants who reached the fantastic level of lifestyles after confinement ( $\chi^2 = 42.3$  men  $p < .001$  and women  $\chi^2 = 126.1$   $p < .001$ ), fewer participants who reached the good category (men  $\chi^2 = 22.4$   $p < .001$  and women  $\chi^2 = 38.8$   $p < .001$ ), higher proportion in the moderate category (men  $\chi^2 = 8.7$   $p = .006$  and women  $\chi^2 = 21.6$   $p < .001$ ) and low in women ( $\chi^2 = 58.3$   $p < .001$ ). In the confinement there were two women who fell into the group of worrisome in their lifestyles.

Regarding the 9 dimensions of the questionnaire, in both genders worsened significantly and with moderate effect sizes family and friends' relationships (men  $p < .001$ ,  $d 0.39$  and women  $p < .001$ ,  $d 0.75$ ) and career (men  $p = .002$ ,  $d 0.33$  and women  $p < .001$ ,  $d 0.39$ ). By gender, practice of physical exercise for men decreased significantly with a moderate effect size ( $p < .001$ ,  $d 0.52$ ), while in women the personality dimensions worsened significantly and with moderate effect sizes ( $p < .001$ ,  $d 0.32$ ) and interior ( $p < .001$ ,  $d 0.36$ ). On the contrary, toxic habits improved by significantly reducing the consumption of tobacco and toxins (men  $p < .001$ ,  $d 0.21$  and women  $p < .001$ ,  $d 0.15$ ) with small effect sizes and alcohol consumption (men  $p < .001$ ,  $d 0.51$  and women  $p < .001$ ,  $d 0.24$ ) with a moderate effect size in men. No differences were found in diet. If we focus on the items in each dimension, the questionnaire also reflects that the effect of confinement has been different for men and women (see **Table 3**). The practice of active exercise of at least 30 minutes decreased significantly and with a large effect size in men ( $p < .001$ ,  $d 0.99$ ), while in women it increased significantly ( $p = .008$ ) with a small effect size ( $d 0.15$ ). Women consumed more drugs (with and without prescription) during confinement significantly and with a large effect size ( $p < .001$ ,  $d 1.58$ ), while men decreased their drug use ( $p < .001$ ,  $d 0.33$ ) with a moderate effect size. For women, during confinement, following a balanced diet ( $p = .045$ ,  $d 0.22$ ) and maintaining an ideal weight ( $p = .013$ ,  $d 0.08$ ) worsened, but excess consumption of sugar, salt, fat and junk food by reducing its consumption ( $p = .050$ ,  $d 0.10$ ) although with small effect sizes. In men, no statistically significant differences were observed in these items. On the other hand, those related to adequate nighttime sleep (7 to 9 hours) with small effect sizes and significant stress episodes improved significantly in both (men  $p = .041$ ,  $d 0.32$  and women  $p = .035$ ,  $d 0.08$ ) with a moderate effect size specifically in men.

**Figure 1** shows the differences between male and female in the effect of confinement for global scores and by dimensions of the questionnaire. In general, confinement affected more women than men ( $p = .010$ ,  $d 0.29$ ), with a small effect size. For women, the aspects that most affected were relationships with family and friends ( $p = .002$ ,  $d 0.29$ ) with a small effect size, personality ( $p < .001$ ,  $d 0.32$ ) and interior ( $p = .001$ ,  $d 0.36$ ) with moderate effect sizes. While for men it affected the performance of physical exercise more negatively ( $p < .001$ ,  $d 0.34$ ) with a moderate effect size. The decrease in alcohol consumption affected more men ( $p < .001$ ,  $d 0.41$ ) with a moderate effect size (see **Table 4**).

Table 5 shows the linear regression model that indicated that the two factors that most affected the change in the score of the FANTASTIC questionnaire were gender ( $p = .008$ ) and BMI, where obesity was the most influential in its categories ( $p = .044$ ).

## Discussion

To date this is the first study evaluating the perceived effect of confinement on the lifestyles of university students in Spain during lockdown. Our findings indicate that in general the lifestyles of university students have worsened significantly during confinement caused by the COVID-19 pandemic in Spain. Especially female university students, who have been the most affected in comparison to their male counterparts. For women, aspects related to social and family relationships, positive thinking or feelings of anger worsened during confinement. For men, the lack of physical exercise was affected to a greater extent. In both, confinement was a protective factor against the consumption of tobacco, toxins and alcohol. However, for women both prescription and non-prescription drug abuse worsened.

The sample of this study was made up mostly of women (73.4%). Half of the sample was studying health sciences, while the men who made up the sample (26.6%) studied engineering or architecture. These statistics in line with current trends in which women are probably more health conscious, more interested in participating in these studies and study more health-based science careers, while men participate less and study university degrees in engineering (40). The anthropometric characteristic studied from the BMI is in line with the national and global data (41, 42), where the majority category is of normal weight (BMI 18.5–24.9 kg / m<sup>2</sup>)

however with a high prevalence of overweight compared to the total (16.4%). This fact could be related to the change to less healthy lifestyles of students during their university life compared to other stages of life (43, 44) and by the social context and the family environment (45). This condition is influenced, the vast majority of college students who lived in student flats before the pandemic decided to return home to spend the lockdown with their parents. Both context situations are key components in the development of health promotion strategies to reduce the number of people who are overweight. Although obesity accounts for 2.9%, it is one of the factors that most affected the change in scores shown in the FANTASTIC questionnaire. Underweight was represented mainly by women (9.5% women vs 1.6% men). According to the 2017 National Health Survey, the prevalence of underweight in women aged between 18 and 24 years old was 12.7% compared to 3.5% in men, which indicates that our sample is close to the reality of the Spanish university population (46). In this sense, underweight continues to be perpetuated as a synonym for beauty, especially among university women, which can lead to future health problems (47).

The socioeconomic context of individuals and the countries impacts on health. In this pandemic, both are at risk since, as the results indicate, most of the students who worked have lost their jobs. Especially women who have in fact lost more jobs. These results are consistent with other studies where Spanish women were slightly more likely to lose their job than men, and those who remained employed were more likely to work from home (48). This situation could be one of the reasons that justify higher feelings of anger and lower positive thoughts in women. Losing a job and having no expectations of finding another in a short period of time could lead to these changes in the Personality and Interior dimensions.

In general, the majority of students descend from a "Good" standard of living to levels classified as "Moderate", "Low" and "Worrying", according to the classification of global scores found in the FANTASTIC questionnaire. This implies the presence of possible health risk indicators (37), which have increased their score due to confinement. On the contrary, there are participants who improved their lifestyles reaching a level classified as "Fantastic". This shows the disparity in the effect of confinement that can be a damaging factor for most and a beneficial factor for some.

The results mainly indicated a worsening of psychological and relationships factors during confinement for women. These results are in line with those presented by a study carried out in Spain with a sample of 2,070 individuals aged between 18 and 75 years old, in which the psychological response of the Spanish population to the Covid-19 Crisis was evaluated. The results showed that women had greater symptoms of depression and anxiety than men. In addition, it concluded that the age group with the most symptoms of depression (42.9%) and anxiety (34.6%) is the youngest (18–24 years old) (49). In our study what is especially striking the results of less honest, open and clear communication with family and friends, provide and receive affect, obtained the emotional support needed and less positive thinking. Social isolation, the inability to continue with the usual routine and the impediment to carry out life projects (trips, ceremonies, parties, meetings, among others) typical of confinement, can promote feelings of anger, aggressiveness or anger. Authors such as Brooks et al. (50), have carried out a review on the psychological effects of quarantine in previous outbreaks such as the Severe Acute Respiratory Syndrome in cities in both China and Canada in 2003, or Ebola in some African countries in the year 2014. Several of the studies indicate that confinement, loss of habitual routine, and reduced social and physical contact with others, are frequently associated with feelings of boredom, frustration, and a feeling of isolation from the rest of the world. All of the above provoke feelings of anguish (51–54). Furthermore, emotional disorders (55), stress (56), anger (57), and low mood and irritability (58) are frequent. These findings are in line with other studies where stress and anxiety levels increase with age and responsibility, however, they affirm that these levels decrease throughout the days of confinement (59).

Men decreased their exercise practice during confinement, while women increased it slightly. These results contrast with other studies such as those of Sánchez-Sánchez et al. (60), where they found that the lack of physical activity during confinement was more notable in women than in men. The difference in exercise patterns between women and men is probably affecting these results. It is likely that women have been able to adapt their physical exercise with synchronous online activities directed by professionals in Yoga, Pilates or Zumba, among others, while men who are more used to collective exercises, have had certain difficulties in continuing with their usual exercise practice.

In general, those aspects related to social behaviors such as alcohol or tobacco consumption have undergone improvements. This allows us to think that confinement may be a protective factor when it comes to students' toxic habits. The first reason a student begins or continues to use drugs and alcohol is the availability and access to those illicit drugs. Most students report that they

have easy access and opportunity to consume cannabinoids and prescription stimulants (61, 62). Secondly, the decrease in the parents' capacity to exert a direct protective effect through the supervision of the whereabouts and activities of their children, especially for students living outside their home (63). However, these two factors have radically changed during confinement and may have an effect on the sense of belonging to the group. Several studies estimate that around 50% of students who smoke identify themselves as social smokers (64–66) and there is a relationship between drug, alcohol and tobacco use (64, 67, 68). Nevertheless, the fact that the consumption of prescription and non-prescription drugs is increasing in women. This fact is probably related to other factors identified in the study, such as that confinement has affected women more in their psychosocial area.

Insomnia or sleep disorders are problems that frequently occur to university students (69, 70). Night preferences (71, 72), social networks, the use of the Internet or mobile phones (73, 74) have been defined as harmful factors for sleep, while the practice of physical activities is beneficial (75, 76). In our results, students increase their hours of sleep and reduce stressful events. Isolation, the provision of more time, the maintenance of exercise practice or living with parents again have probably contributed to this improvement. These results are in accordance with the study of Romero-Blanco et al. (29), where they found that nursing students slept more hours during lockdown. However, according to this study, the quality of sleep worsened.

## Strengths And Limitations

Faced with the threat of future outbreaks in the COVID-19 pandemic or new pandemics worldwide, this study shows that the university population may be harmed in their healthy lifestyles. Especially university women are the most affected during confinement. In this sense, it is essential to develop strategies that favor the social and psychological factors that are negatively affecting the health of students with a gender perspective. This implies necessary strategies for health promotion with a gender approach that addresses the differences between women and men in an equitable manner (77, 78). The sample size of this cross-sectional survey was relatively large having exceeded the initial number of the sample size calculation. The included participants had generalizable characteristics to the Spanish university population. Participants were recruited from most of the Spanish regions who were studying at various Spanish universities. An important aspect of the study is the contrasting measurement of outcome factors before and during the pandemic.

However, general statements and interpretations of current findings should be made with caution, some differences founded are clinically small. One of the main limitations of the study was the self-reported data that implies the chance of reporting bias. Another factor is that there were no reporting data of the participants' socioeconomic status, which could be an important for the analysis.

## Conclusions

Findings showed that Spanish university students have seen their healthy lifestyles diminished during confinement by COVID-19. Females reported worsening in their lifestyles than males. Psychological and social factors are the more affected for women, while exercise practice for males. Adapted strategies should be developed to try to mitigate its impact with a gender perspective. Aspects related to the consumption of toxics and drugs have been diminished thanks to confinement, which could be a protective factor. At this point, for females the drug consumptions have been worsened. In this sense, this research has revealed the need to develop interventions that provide the adoption of healthy lifestyles in the Spanish university population during confinement by COVID-19.

## List Of Abbreviations

COVID-19

Coronavirus Disease 2019

SARS-CoV-2

Severe Acute Respiratory Syndrome Coronavirus 2

STROBE

Strengthening the Reporting of Observational studies in Epidemiology

BMI

Body Mass Index  
SD  
Standard Deviation

## Declarations

### Ethics approval and consent to participate

The project was approved by the Research Ethics Committee of the (*blinded for review*) University (code: 06\_CEI\_2020)

### Consent for publication

Not applicable.

### Availability of data and materials

All data generated or analysed during this study are included in this published article.

### Competing interests

None of the Authors have conflicts of interest to declare.

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This research received no external funding.

### Authors' contributions

Conceptualization, methodology, software, validation, formal analysis, investigation, resources and data curation, C. R-Z, L. G-G and D. P-M; writing—original draft preparation, writing—review and editing, visualization, C. R-Z, L. G-G, D. P-M, A. V-M, N. M-G, M. L-V, M. R-L; supervision and project administration, C. R-Z, L. G-G and D. P-M. All authors have read and agreed to the published version of the manuscript.

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## Tables

**Table 1: Sociodemographic data of the participants.**

Sociodemographic characteristics	Total Sample (n = 488)	Male (%) 129 (26.4)	Female (%) 359 (73.6)	p-value
<b>Age (years)</b>				
Median (Min-Max)	21 (18 – 54)	21 (18-54)	21 (18-49)	0.205
<b>BMI (kg/m<sup>2</sup>)</b>				
<18.5 Underweight (%)	36 (7.4)	2 (1.6)	34 (9.5)	$\chi^2=8.71, p=.003$
18,5 – 24.9 Normal (%)	358 (73.4)	97(75.2)	261 (72.7)	$\chi^2=3.02, p=.583$
25 – 29.9 Overweight (%)	80 (16.4)	28 (21.7)	52 (14.5)	$\chi^2=3.61, p=.057$
>30 Obesity (%)	14 (2.9)	2 (1.6)	12 (3.3)	$\chi^2=1.09, p=.373^*$
<b>Region of Spain where you study</b>				
Madrid (%)				
Valencia Region (%)	111 (22.7)	31 (24)	80 (22.3)	$\chi^2=2.99, p=.224$
Basque Country (%)	102 (20.8)	33 (25.6)	69 (19.2)	$\chi^2=2.32, p=.227$
Andalusia (%)	85 (17.4)	32 (24.8)	53 (14.8)	$\chi^2=9.63, p=.008$
Others (%)	71 (14.5)	10 (7.8)	61 (17)	$\chi^2=9.15, p=.010$
	119 (24.6)	23 (17.8)	96 (26.7)	$\chi^2=4.09, p=.043$
<b>Knowledge Areas of students studies</b>				
Art & Humanities (%)				
Science (%)	22 (4.5)	4 (3.1)	18 (5)	$\chi^2=0.81, p=.369$
Health Science (%)	33 (6.8)	11 (8.5)	22 (6.1)	$\chi^2=0.87, p=.352$
Engineering &Architecture (%)	245 (50.2)	40 (31)	205 (57.1)	$\chi^2=25.85, p=.001$
Social & Legal Science (%)	73 (15)	41 (31.8)	32 (8.9)	$\chi^2=39.02, p=.001$
	115 (23.6)	33 (25.6)	82 (22.8)	$\chi^2=0.38, p=.539$
<b>Employment Pre</b>				
Yes (%)	133 (27.3)	47 (36.4)	86 (24)	$\chi^2=7.5, p=.006$
Hours per week	(n = 131)	(n = 47)	(n = 84)	p=.490
Median (Min-Max)	20 (1 – 54)	20 (2-54)	17 (1-48)	
<b>Employment During</b>				
Yes (%)	54 (11.1)	21 (16.3)	33 (9.2)	$\chi^2=4.8, p=.028$
Hours per week	(n = 49)	(n=19)	(n=30)	p=.221
Median (Min-Max)	30 (0 – 84)	30 (2-84)	30 (0-40)	
<b>Have you moved since the confinement?</b>				
Yes (%)	266 (54.5)	64 (49.6)	202 (56.3)	$\chi^2=1.7, p=.193$

<b>People you live Pre</b>				
Alone (%)	23 (4.7)	6 (4.7)	17 (4.7)	$\chi^2=0.01, p=.969$
With my parents (%)	238 (48.8)	71 (55)	167 (46.5)	$\chi^2=5.80, p=.055^*$
With my roommates (%)	203 (41.6)	46 (35.7)	157 (43.7)	$\chi^2=5.14, p=.077^*$
With my partner (%)	24 (4.9)	6 (4.7)	18 (5)	$v=0.39, p=.823^*$
<b>People you live during</b>				
Alone (%)	17 (3.5)	4 (4.1)	13 (3.6)	$\chi^2=0.44, p=.803^*$
With my parents (%)	422 (86.5)	112 (86.8)	310 (86.4)	$\chi^2=0.04, p=.893$
With my roommates (%)	20 (4.1)	5 (3.9)	15 (4.2)	$\chi^2=0.02, p=.882$
With my partner (%)	29 (5.9)	8 (6.3)	21 (5.8)	$\chi^2=0.02, p=.885$
<b>Symptoms of COVID-19</b>				
Yes (%)	37 (7.6)	14 (89.1)	23 (6.4)	$\chi^2=2.7, p=.102$
<b>People you live presents symptoms of COVID-19</b>				
Yes (%)	22 (4.5)	6 (4.7)	16 (4.5)	$\chi^2=0.1, p=.927$
<b>Do you leave your home?</b>				
Yes (%)	200 (41)	55 (42.6)	143 (39.8)	$\chi^2=0.3, p=.578$
Times a week	(n=200)	(n=55)	(n=155)	
Median (Min-Max)	2 (1-17)	2 (1-14)	2 (1-17)	$p=.952$
<b>Characteristic of your home</b>				
Terraced house (%)	49 (10)	12 (9.3)	37 (10.3)	$\chi^2=0.47, p=.790^*$
Independent house (%)	91 (18.6)	22 (17.1)	69 (19.2)	$\chi^2=0.29, p=.588$
Flat without balcony (%)	110 (22.59)	29 (22.5)	81 (22.6)	$\chi^2=0.36, p=.835^*$
Flat with balcony (%)	238 (48.8)	66 (51.2)	172 (47.9)	$\chi^2=0.40, p=.526$

\* Fisher's exact test. When any of the expected values <5

Table 2  
Participants characteristics pre and during confinement

<b>Variables</b>	<b>Pre-confinement (n = 488)</b>	<b>During-confinement (n = 488)</b>	<b>p-value</b>
People you live	23 (4.7)	17 (3.5)	$\chi^2 = 141.2, p < .001$
Alone (%)	238 (48.8)	422 (86.5)	$\chi^2 = 0.3, p < .001$
With my parents (%)	203 (41.6)	20 (4.1)	$\chi^2 = 20.1, p < .001$
With my roommates (%)	24 (4.9)	29 (5.9)	$\chi^2 = 300.1, p < .001$
With my partner (%)			
Employment Yes (%)	133 (27.3)	54 (11.1)	$\chi^2 = 96.3, p < .001^*$
Hours per week work Median (Min-Max)	20 (1–54)	30 (0–84)	$p < .001$
* Fisher's exact test. When any of the expected values < 5			

Table 3. FANTASTIC global scores, dimensions, items and categories of the study population pre and during confinement by gender.

Variables	Male (n=129)		p-value	Effect size	Female (n=359)		p-value	Effect size
	Mean pre- conf (SD)	Mean during- conf (SD)			Mean pre- conf (SD)	Mean during-conf (SD)		
<b>FANTASTIC Global Score</b>	76.4(±8.0)	75.5(±10.4)	.198	0.16	74.2(±8.3)	71.0(±11.5)	<b>&lt;.001</b>	0.32
<b>FANTASTIC dimensions &amp; items</b>								
<b>FAMIL &amp; FRIENDS</b>	9.9(±1.9)	9(±2.7)	<b>&lt;.001</b>	0.39	10(±1.9)	8.2(±2.8)	<b>&lt;.001</b>	0.75
<b>Honest, open and clear communication</b>	3.5(±0.6)	3.2(±0.9)	<b>.001</b>	0.39	3.5(±0.7)	3.0(±0.9)	<b>&lt;.001</b>	0.62
<b>I provide and receive affection</b>	3.3(±0.8)	2.9(±1.1)	<b>&lt;.001</b>	0.42	3.3(±0.8)	2.6(±1.2)	<b>&lt;.001</b>	0.69
<b>I obtain the emotional support I need</b>	3.2(±0.9)	2.8(±1.1)	<b>.001</b>	0.40	3.1(±0.9)	2.6(±1.2)	<b>&lt;.001</b>	0.47
<b>PHYSICAL EXERCISE</b>	6.4(±1.5)	5.4(±2.3)	<b>&lt;.001</b>	0.52	5.2(±1.8)	5.3(±2.3)	.452	0.05
<b>Active exercise 30 minutes</b>	4.2(±1.0)	3.5(±1.5)	<b>&lt;.001</b>	0.99	2.4(±1.3)	2.6(±1.4)	<b>.008</b>	0.15
<b>Relaxation and enjoy of the free time</b>	3.2(±0.9)	3.0(±1.4)	.106	0.17	2.8(±1.1)	2.7(±1.4)	.064	0.08
<b>NUTRITION</b>	11.0(±2.3)	11.2(±2.4)	.326	0.09	11.4(±2.0)	11.3(±2.2)	.449	0.05
<b>Balanced diet</b>	3.1(±0.9)	3.2(±0.9)	.052	0.11	3.1(±0.8)	2.9(±1.0)	<b>.045</b>	0.22
<b>Daily breakfast</b>	3.1(±1.4)	3.2(±1.4)	.261	0.07	3.3(±1.2)	3.3(±1.3)	.965	0.00
<b>Excess sugar, salt, fats or junk foods</b>	1.6(±0.9)	1.4(±1.1)	.128	0.20	1.7(±0.9)	1.8(±1.1)	<b>.050</b>	0.10
<b>You are in the ideal weight</b>	3.4(±1.2)	3.4(±1.2)	.867	0.00	3.4(±1.2)	3.3(±1.2)	<b>.013</b>	0.08
<b>TOBACCO &amp; TOXICS</b>	9.7(±2.5)	10.2(±2.2)	<b>&lt;.001</b>	0.21	9.9(±2.1)	10.2(±1.8)	<b>&lt;.001</b>	0.15
<b>Tobacco consumption</b>	3.0(±1.6)	3.1(±1.5)	<b>.016</b>	0.06	3.0(±1.5)	3.1(±1.4)	<b>.001</b>	0.07
<b>Drug abuse</b>	3.5(±1.0)	3.8(±0.8)	<b>&lt;.001</b>	0.33	4.7(±0.8)	3.7(±0.4)	<b>&lt;.001</b>	1.58
<b>Coffee, tea, cola beverages</b>	3.2(±0.6)	3.3(±0.7)	<b>.009</b>	0.15	3.2(±0.6)	3.2(±0.7)	.438	0.00
<b>ALCOHOL</b>	7.4(±1)	7.8(±0.5)	<b>&lt;.001</b>	0.51	7.8(±0.5)	7.9(±0.3)	<b>&lt;.001</b>	0.24
	3.6(±0.8)	3.8(±0.5)			3.9(±0.4)	3.9(±0.3)		
<b>Weekly mean consumption</b>	3.8(±0.5)	4.0(±0.1)	<b>.001</b>	0.30	3.9(±0.4)	4.0(±0.1)	<b>.049</b>	0.00
<b>Drink alcohol and drive</b>			<b>&lt;.001</b>	0.55			<b>&lt;.001</b>	0.34
<b>RELAX, SECURITY ANS STRESS</b>	9.9(±1.8)	9.9(±2.2)	.905	0.00	9.2(±1.9)	9.2(±2.4)	.731	0.00
<b>Sleeps 7 to 9 hours per night</b>	2.8(±1.2)	3.0(±1.3)	<b>.011</b>	0.16	2.6(±1.2)	2.9(±1.3)	<b>&lt;.001</b>	0.24
<b>Frequency do you use the safety belt</b>	3.9(±0.5)	3.5(±1.3)	<b>&lt;.001</b>	0.41	3.9(±0.3)	3.5(±1.3)	<b>&lt;.001</b>	0.42
<b>Important stress episodes</b>	3.2(±1.0)	3.5(±0.9)	<b>.041</b>	0.32	2.7(±1.2)	2.8(±1.3)	<b>.035</b>	0.08

<b>PERSONALITY</b>	7.9(±2.1)	8(±2.6)	.470	0.04	8.0(±2.1)	7.2(±2.8)	<b>&lt;.001</b>	0.32
<b>Feeling of urgency or impatience</b>	2.6(±1.0)	2.6(±1.1)	1.000	0.00	2.2(±1.0)	2.0(±1.1)	<b>.002</b>	0.19
<b>Competitiveness and aggressiveness</b>	2.4(±1.0)	2.7(±1.1)	<b>.001</b>	0.29	2.9(±0.9)	2.8(±1.1)	<b>.011</b>	0.10
<b>Feelings of anger and hostility</b>	3.0(±0.9)	2.7(±1.1)	<b>.018</b>	0.29	3.0(±0.9)	2.4(±1.2)	<b>&lt;.001</b>	0.57
<b>INTERIOR</b>	8.4(±1.8)	8.2(±2.5)	.689	0.09	7.4(±2.2)	6.5(±2.8)	<b>&lt;.001</b>	0.36
<b>Thinks positively</b>	3.1(±0.8)	2.8(±0.9)	<b>&lt;.001</b>	0.35	2.8(±1.0)	2.2(±1.1)	<b>&lt;.001</b>	0.57
<b>Anxiety and concern</b>	2.4(±1.0)	2.3(±1.1)	.171	0.10	1.9(±1.0)	1.5(±1.1)	<b>&lt;.001</b>	0.38
<b>Depression</b>	3.4(±0.9)	3.2(±1.0)	<b>&lt;.001</b>	0.21	3.1(±1.0)	2.7(±1.2)	<b>&lt;.001</b>	0.38
<b>CAREER</b>	6.2(±1.4)	5.7(±1.6)	<b>.002</b>	0.33	6.0(±1.3)	5.3(±2.2)	<b>&lt;.001</b>	0.39
<b>Satisfaction with the work and the activities</b>	2.9(±0.9)	2.5(±1.0)	<b>&lt;.001</b>	0.42	2.8(±1.0)	2.1(±1.8)	<b>&lt;.001</b>	0.48
<b>Good relationships with those around you</b>	3.6(±0.6)	3.2(±0.9)	<b>&lt;.001</b>	0.52	3.5(±0.6)	3.2(±0.9)	<b>&lt;.001</b>	0.39
<b>FANTASTIC categories</b>	n(%)	n(%)	$\chi^2=42.3$		n(%)	n(%)	$\chi^2=126.1$	
<b>Fantastic</b>	18(14)	31(23.3)	<b><math>p&lt;.001^*</math></b>		34(9.5)	42(11.7)	<b><math>p&lt;.001^*</math></b>	
<b>Good</b>	86(66.7)	65(50.4)	$\chi^2=22.4$ <b><math>p&lt;.001</math></b>		226(63)	163(45.4)	$\chi^2=38.8$ <b><math>p&lt;.001</math></b>	
<b>Moderate</b>	22(17.1)	24(18.6)	$\chi^2=8.7$ <b><math>p=.006^*</math></b>		85(23.7)	95(26.5)	$\chi^2=21.6$ <b><math>p&lt;.001</math></b>	
<b>Low</b>	3(2.3)	9(7)	$\chi^2=23.0$ $p=.804^*$		14(3.9)	57(15.9)	$\chi^2=58.3$ <b><math>p&lt;.001^*</math></b>	
<b>Worrying</b>	0	0	NA		0	2(0.6)	NA	

SD = Standard Deviation; Effect size = Cohen's  $d$  (0-0.3 low, >0.3-0.8 moderate, >0.8 big); NA = Not Applicable; \* Fisher's exact test. When any of the expected values <5

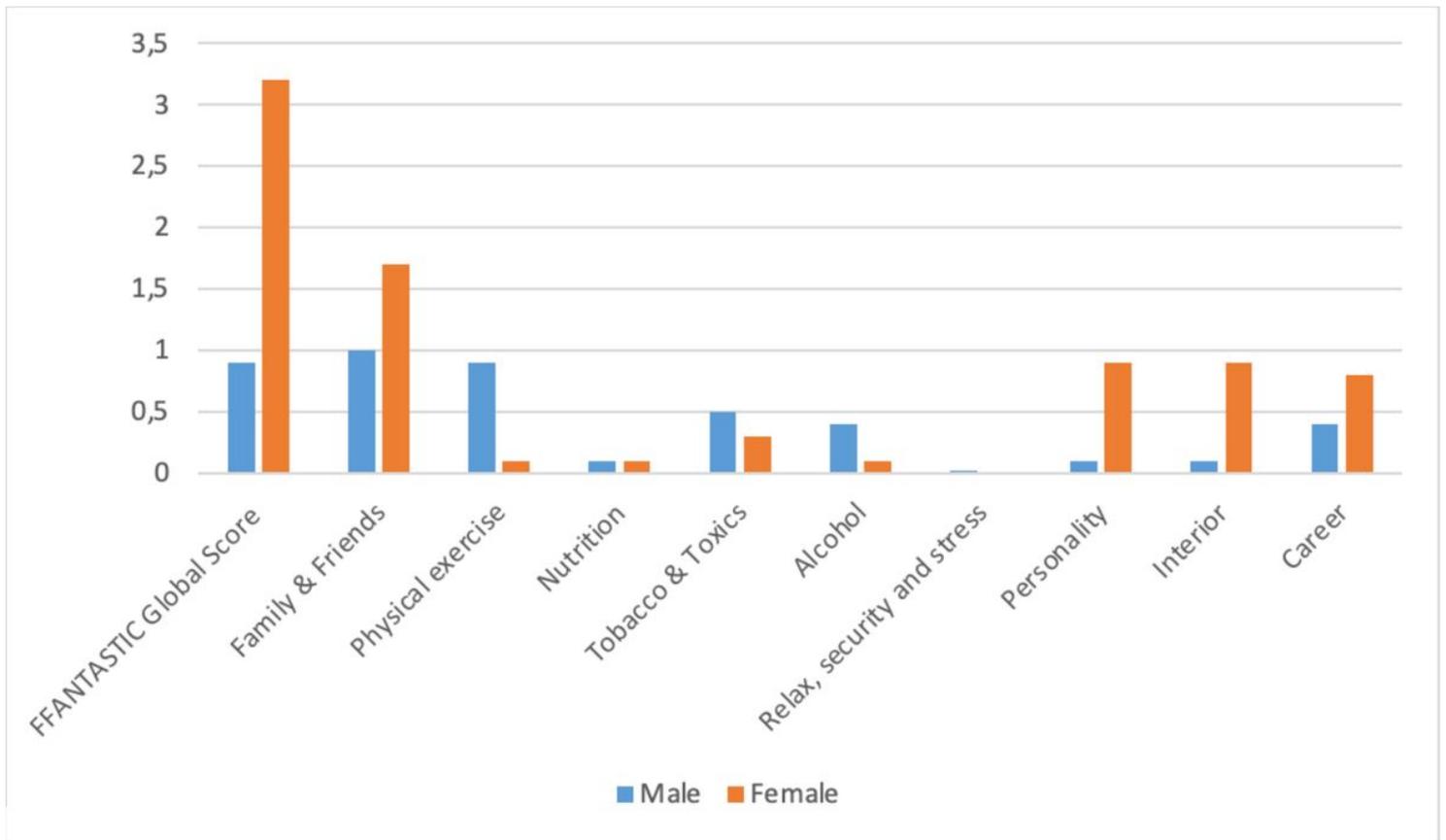
Table 4  
FANTASTIC global dimension and score differences between male and female before and during confinement.

Parameters of FANTASTIC questionnaire	Dif Male (SD)	Dif Female (SD)	P value	Effect size
FANTASTIC Global Score	0.9 (± 8.0)	3.2 (± 8.7)	.010	0.29
FANTASTIC dimensions	1.0 (± 2.4)	1.7 (± 2.5)	.002	0.29
Family & Friends	0.9 (± 2.2)	-0.1 (± 2.5)	< .001	0.34
Physical exercise	-0.1 (± 1.5)	0.1 (± 1.7)	.244	0.00
Nutrition	-0.5 (± 1.2)	-0.3 (± 1.1)	.120	0.17
Tobacco & Toxics	-0.4 (± 0.9)	-0.1 (± 0.5)	< .001	0.41
Alcohol	-0.02 (± 2.2)	0.0 (± 2.3)	.781	0.00
Relax, security and stress	-0.1 (± 2.4)	0.9 (± 2.6)	< .001	0.32
Personality	0.1 (± 2.2)	0.9 (± 2.3)	.001	0.36
Career	0.4 (± 1.6)	0.8 (± 2.2)	.081	0.21
Dif = difference pre vs during confinement; SD = Standard Deviation				

Table 5  
Factors associated with decreased in FANTASTIC score.

	Coef (CI 95%)	p-value
Gender	2.35 (4.09–0.62)	.008
BMI (Kg/m <sup>2</sup> )	2.34 (0.61–5.28)	.119
18,5–24.9 Normal weight (%)	1.61 (1.78–5.00)	.351
25–29.9 Overweight (%)	5.40 (0.14–10.67)	.044
> 30 Obesity (%)		
Pseudo R2 0.0235		

## Figures



**Figure 1**

Mean differences between male and female before and during confinement.

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryFile1STROBEchecklist.doc](#)